DATA VALIDATION CHECKLIST

Soil Samples, collected in February, 1999	**99-1616**	**99-1965**	**99-1352**	**99-1424**	**99-1482**
	FB-4	BL-4-7	BL-1-11.5	BL-2-11.5	BL-5-8
	RB-4	BL-4-17	BL-1-21	BL-2-21.5	BL-5-10
	BL-3-13	FB-5	BL-1-23.7	FB-2	BL-5-20
	BL-3-23	RB-5	FB-1	RB-2	TB-1
	BL3-25.7	BL-8-12	RB-1	BL-6-11	FB-2
		BL-8-22		BL-6-21	RB-3

Groundwater Samples, collected in March, 1999	**99-2656**	**99-2582**	**99-2725**	**99-2497**	**99-2724**
	P-6B	P-10	P-7	BL-6	TB-9A
	EB-2	P-3	P-16A	FB-6	TB-9B
	P-24	EB-1	P-20	RB-6	FB-9
	P-9B	Trip blank	P-29	TB-6	RB-9
	P-22	**99-2580**	EB-3	**99-2652**	BL-5
	P-12	BL-7	P-17	TB-8	BL-17
	P-2	BL-4	P-1	RB-8	BL-1
	P-16C	BL-8	EB-4	FB-8	
		TB-7		BL-3	
		RB-7		BL-2	
		FB-7			

Sample Date(s):	Soil (2/2, 2/3, 2/4,2/8, 2/16/99), and Liquid (3/1, 3/2, 3/3, 3/4/99)
Sample Team:	ARCADIS Geraghty & Miller- B. Hawes
Sample Matrix:	Soil, Liquid
Analyzing Laboratory:	BC Laboratories, Inc.
Analyses:	8260/VOCs; 8015/Fuel ID (FFP); CAM 17 Metals (Total and Dissolved); Hexavalent Chromium (Cr^{6+})
QA Reporting Level:	ARCADIS Geraghty & Miller, Inc. Contract Level II
Laboratory Report No	99-2580, 99-1965, 99-2652, 99-2497, 99-2724, 99-2656, 99-2725, 99-1352, 99-2582, 99-1424, 99-1616, 99-1482

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Environmental

Project: Lockheed/ILM

Project Number:CA000280.0004
Task:0002

FIELD DATA PACKAGE DOCUMENTATION

Field Sampling Logs: *	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sampling dates noted		X		X	
2. Sampling team indicated		X		X	
3. Sampling identification traceable to location collected		X		X	
4. Sample location		X		X	
5. Sample depth for soils		X		X	
6. Collection technique (bailer, pump, etc.)		X		X	
7. Field sample preparation techniques		X		X	
8. Sample type (grab, composite)		X		X	
9. Sample container type		X	X		
10. Preservation methods		X		X	
11. Chain-of-custody form completed		X		X	
12. Required analytical methods requested		X		X	
13. Field (water and soil) sample logs completed properly and signed		X		X	
14. Number and type of field QC samples collected (blanks, replicates, splits, etc.)		X		X	
15. Field equipment calibration		X		X	
16. Field equipment decontamination		X		X	
17. Sample shipping		X		X	
18. Laboratory task order	X				X

*Field sampling logs = water and/or soil/sediment sampling logs
QC - quality control

Comments:

9. Due to a sample container switch during field sampling, the groundwater sample, P-12, was subcontracted to Zymax Envirotechnology at a later date for reanalysis of total metals. Results initially reported for total metals were actually considered as dissolved metals results and were amended by the laboratory. Results for the metals; Hg, Se, Cr^{6+}, and As, remained unchanged for total metals since the preparation is the same. The sample was digested and reanalyzed for total metals.

14. Sample BL-17 was collected as a duplicate of the primary field sample, BL-1. Sample P-29 is a duplicate of primary sample P20. Comparison of duplicate results is completed for each analytical section below.

18. The LTO was not reviewed.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Sample results		X		X	
2. Parameters analyzed		X		X	
3. Method of analysis		X		X	
4. Reporting limits of analysis		X		X	
5. Master tracking list	X				X
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preparation/extraction date		X		X	
9. Sample analysis date		X		X	
10. Copy of chain-of-custody form signed by lab sample custodian		X		X	
11. Narrative summary of QA or sample problems provided		X		X	

QA - quality assurance

*ILM samples collected on the above referenced dates were presented in the 12 corresponding reports. The associated QC was submitted with each report. Soil samples were collected during the February, 1999, monitoring well installation. Monitoring wells were developed and groundwater samples were collected during the March sampling events.

** It should be noted that Initial and Continuing Calibration data for all of the above referenced methods were included with the analytical reports. Review of calibration data is beyond the scope of a Level II data validation and the calibration data were not reviewed.

INORGANIC ANALYSES
TOTAL AND DISSOLVED METALS METHODS

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Holding times		X		X	
2. Reporting limits		X		X	
3. Blanks					
A. Preparation and calibration blanks		X		X	
B. Equipment rinsate blanks		X	X		
C. Field blanks		X	X		
4. Laboratory control sample (LCS) %R		X		X	
5. Matrix spike (MS) %R		X	X		
6. MS duplicate %R and MS/MSD RPD		X	X		
7. Laboratory duplicate RPD	X				X
8. Field duplicate comparison		X		X	
9. Total and dissolved metals comparison		X		X	

%R - percent recovery
%D - percent difference
RPD - relative percent difference
MSD - matrix spike duplicate
NA - not applicable or not analyzed
FAA - furnace atomic absorption
ICP - inductively coupled plasma atomic emission spectroscopy

Comments:

This section was reviewed and completed for the analysis of metals by Methods 6010, SM-3114, 7421, 7470, 7196 and 7841. Metals analyzed include Sb, As, Ba, Be, Cd, Cr, Cr^{6+}, Co, Cu, Pb, Hg, Mo, Ni, Se, Ag, Tl, V, and Zn. Metals were analyzed as both total and dissolved for the groundwater sampling events only. Performance was acceptable, with the following exceptions and notes.

1. The following water samples missed technical holding time(24hrs), for Hexavalent Chromium analysis. In accordance with the National Functional Guidelines, all results reported as ND are qualified as "UJ/Estimated, non-detect," and all detected values as "J/Estimated, detected:" The SW-846 holding time for Hexavalent Chromium in soil matrices, is 30 days from time of sampling to extraction and 4 days from extraction to analysis. All detected values for soil samples analyzed outside of holding time were qualified as "J/Estimated, detected."

Sample	Report	Result	Days out	Qualifier
P-2 (water)	99-2656	2.5ppb	1	J
P-16C (water)	99-2656	ND	1	UJ
BL-5-10 (soil)	99-1482	1.2ppb	12	J
BL-1-11.5 (soil)	99-1352	0.4ppb	13	J
P-10 (water)	99-2582	31ppb	1	J

2. The following samples required the corresponding dilution due to high concentrations of target analyte. All reporting limits were adjusted accordingly.

Sample	Analyte(s), Dilution factor
P-1	Total Mercury (5X)
P-6B	Total Lead (2X)
P-24	Total Lead (2X)
P-9B	Total Lead (2X)
P-22	Total Lead (2X)
P-2	Total Lead (2X)
P-16C	Total Lead (2X)
BL-5-10	All analytes (2X), Total Mercury (12.5X)
BL-5-20	All analytes (2X), Total Mercury (12.5X)
BL-17	Total arsenic (10X), Total Lead (4X)

TOTAL AND DISSOLVED METALS METHODS Cont.

2. cont.

Sample	Analyte(s), Dilution factor
BL-1	Total arsenic (5X), Total Lead (2X)
BL-2-11.5	All analytes (2X), Total Mercury (12.5X)
BL-2-21.5	All analytes (2X), Total Mercury (12.5X)
BL-6-11	All analytes (2X), Total Mercury (12.5X)
BL-6-21	All analytes (2X), Total Mercury (12.5X)
BL-2	Total Arsenic (5X)
BL-6	Total Arsenic (10X)
BL-7	Total Arsenic (5X), Total Lead (4X)
BL-4	Total Lead (4X)
BL-8	Total Arsenic (5X), Total Lead (4X)
BL-1-11.5	All analytes (2X), Total Mercury (12.5X)
BL-1-21	All analytes (2X), Total Mercury (12.5X)
BL-1-23.7	All analytes (2X), Total Mercury (12.5X)
BL-3-13	All analytes (2X), Total Mercury (12.5X)
BL-3-23	All analytes (2X), Total Mercury (12.5X)
BL-3-25.7	All analytes (2X), Total Mercury (12.5X)
P-1	Hexavalent Chromium (40X)
BL-6	Hexavalent Chromium (10X)

3. The following analytes were detected for the corresponding blank samples. In accordance with the National Functional Guidelines, the blank with the highest concentration of detected contaminant is used for qualification. When sample results are greater than the detection limit, but less than 5X the highest amount found in any blank, then the results for that analyte are qualified as "U/Not detected." No action is taken for samples reported as ND. The following is a list of results qualified due to blank contamination.

Sample	Report	Analyte(s)	Action, Qualified samples
FB-9	99-2724	Copper (total) 38ppb	All assoc. samples ND
FB-8	99-2652	Copper (total) 40ppb	All assoc. samples ND
RB-6	99-2497	Copper (total) 27ppb	BL-6(12ppb, U)
FB-2	99-2580	Copper (total) 64ppb	BL-8(22ppb, U)
RB-3	99-1482	Copper (total) 22ppb (0.0011 mg/kg)	All assoc. samples >5X
FB-4	99-1616	Copper (total) 22ppb (0.0011 mg/kg)	All assoc. samples >5X
RB-2	99-1424	Copper (total) 30ppb (0.0015 mg/kg)	All assoc. samples >5X
RB-1	99-1352	Copper (total) 17ppb (0.00085 mg/kg)	All assoc. samples >5X
RB-5	99-1965	Copper (total) 36ppb (0.0018 mg/kg)	All assoc. samples >5X

5-6a. The following is a list of MS/MSD QC with %recovery values outside of the laboratory established control limits. Effected samples are listed below (5-6b.). Results associated with MS/MSD samples outside of the control limits have been qualified in accordance with the National Functional Guidelines. When the %recovery is greater than 125%, qualified all associated detected values as "J/Estimated, detected." No action is taken for ND results. When the %recovery is between 30-74%, detected results are qualified as "J/Estimated, detected," and ND results as "UJ/Estimated, non-detect."

MS/MSD Sample	Analyte(s)	Results	Control Limits	Qualifiers
P-24	Titanium	137/ 135%	80-120%	J
BL-3-13	Titanium	184/169%	80-120%	J
BL-3-13	Antimony	47/ 48%	75-125%	J/UJ
BL-3-13	Zinc	MSD 204%	80-120%	J
BL-1-11.5	Antimony	41/ 39%	75-125%	J/UJ
BL-8-22	Antimony	45/ 46%	75-125%	J/UJ
BL-5-20	Antimony	44/ 41%	75-125%	J/UJ
BL-5-20	Titanium	MSD 131%	80-120%	J

5-6b. The following samples were used for MS/MSD analysis. QC samples with %recovery values outside of the control limits have been qualified in accordance with the National Functional Guidelines.

Sample	Report(s)	Analyte(s)	Results
P-12	99-2656	N/A	Acceptable
P-7	99-2725	N/A	Acceptable
BL-8-22	99-1965	Antimony (total)	BL-4-7 (1.0ppb, J), BL-4-17 (ND, UJ), BL-7-14.5(1.2ppb, J), BL-7-24.5(0.86ppb, J), BL-8-12(1.1ppb, J), BL-8-22(ND, UJ)
BL-1-11.5	99-1352	Antimony (total)	BL-1-23.7(0.8ppb, J), BL-1-21(ND, UJ), BL-1-11.5(1.4ppb, J)
BL-4	99-2582, 99-2582, 99-2497	N/A	Acceptable
RB-8	99-2652	Total metals	Acceptable
P-17	99-2652	Dissolved metals	Acceptable
P-9B	99-2656, 99-2724	Dissolved metals	Acceptable
P-24	99-2656, 99-2724	Titanium (total)	P-24(274ppb, J), P-9B(295ppb, J), P-22(139ppb, J), P-2(73ppb, J), P-16C(209ppb, J)
BL-3-13	99-1616	Antimony (total)	BL-3-25.7(1.0ppb, J), BL-3-13(0.89ppb, J), BL-3-23(5.9ppb, J)
BL-3-13	99-1616	Zinc (total)	BL-3-25.7(74ppb, J), BL-3-13(70ppb, J), BL-3-23(70ppb, J)
BL-3-13	99-1616	Titanium (total)	BL-3-25.7(1630ppb, J), BL-3-23(1350ppb, J)
BL-5-20	99-1424	Antimony	BL-2-11.5 (0.72ppb, J), BL-2-21.5 (ND, UJ), BL-6-11 (ND, UJ), BL-6-21 (ND, UJ)
BL-5-20	99-1482	Antimony	BL-5-10(ND, UJ), BL-5-20 (0.52ppb, J)
BL-5-20	99-1424	Titanium	BL-2-11.5(1710ppb, J),BL-2-21.5(1600ppb, J),BL-6-11(1890ppb, J), BL-6-21 (1900ppb, J)
BL-5-20	99-1482	Titanium	BL-5-10(1670ppb, J), BL-5-20 (1620ppb, J)

8. Field duplicate sample BL-17 was compared to primary sample BL-1 for CAM 17 metals and Hexavalent Chromium analyses. The following comparison is of detected results only. Detected values are for total metals unless otherwise indicated. All other analytes were reported as ND for both samples. Field duplicate evaluation is applied using 20% RPD for water samples and 35% RPD for soil samples. The following analytical results for the primary sample and field duplicate are qualified as "J/Estimated, detected," when the %RPD is +/-20% for detected results greater than 5X the detection limit.

Analyte	BL-17 (ppb)	BL-1 (ppb)	%RPD	POL	Qualifier
Dissolved Iron	50	ND	Trace	50	no action taken
Aluminum	131,000, J	97,800, J	29%	50	J
Arsenic	166 (10X) , J	110 (5X) , J	41%	20	J
Barium	508, J	367, J	32%	10	J
Chromium	280, J	195, J	36%	10	J
Cobalt	111, J	73, J	42%	10	J
Copper	146, J	110, J	28%	10	J
Iron	229,000, J	154,000, J	39%	50	J
Lead	87 (4X) , J	55 (2X) , J	45%	5.0	J
Mercury	0.46	0.29	45%	0.2	no action taken
Molybdenum	17	12	34%	10	no action taken
Nickel	182	123	39%	50	no action taken
Selenium	3.5	2.4,	30%	2.0	no action taken
Titanium	7510, J	4920, J	42%	10	J
Vanadium	459, J	317, J	37%	10	J
Zinc	654, J	394, J	50%	50	J
Hex. Chromium	4.8	4.1	16%	2.0	no action taken

TOTAL AND DISSOLVED METALS METHODS Cont.

8. Duplicate sample P-29 was compared to primary sample P-20 for CAM 17 metals and Hexavalent Chromium analyses. The following comparison is of detected results only. The metals are for total metals unless otherwise indicated. Field duplicate evaluation is applied using 20% RPD for water samples and 35% RPD for soil samples. The following analytical results for the primary sample and field duplicate are qualified as "J/Estimated, detected," when the %RPD is +/-20% for detected results greater than 5X the detection limit.

Analyte	P-29 (ppb)	P-20 (ppb)	%RPD	PQL
Diss. Chromium	28	27	4%	10
Aluminum	4690	4060	14%	50
Arsenic	4.5	4.4	2%	20
Barium	106	102	4%	10
Chromium	43	39	10%	10
Cobalt	22	19	15%	10
Copper	12	23	63%	10
Iron	6360	5700	11%	50
Lead	6.0	5.2	14%	5.0
Titanium	329	290	12%	10
Vanadium	15	12	22%	10
Hex. Chromium	33	35	6%	2.0

9. A comparison of Total versus Dissolved metals was completed for all groundwater samples analyzed for both metals constituents. All metal results were acceptable.

ORGANIC ANALYSES

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
GAS CHROMATOGRAPHY (GC) OR HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC)					
1. Holding times					
A. Extraction holding time		X		X	
B. Analysis holding time		X		X	
2. Reporting limits		X		X	
3. Blanks					
A. Instrument blank		X		X	
B. Extraction blanks	X				X
C. Equipment rinsate blanks		X		X	
D. Field Blanks		X		X	
E. Trip blanks	X				X
4. Matrix spike (MS) %R		X		X	
5. Matrix spike duplicate (MSD) %R		X		X	
6. MS/MSD precision (RPD)		X		X	
7. Laboratory duplicate (optional)	X				X
8. Reagent water spike (BS)		X		X	
9. Reagent water spike duplicate (BSD)		X		X	
10. BS/BSD precision (RPD)		X		X	
11. Surrogate spike recoveries		X		X	
12. Field duplicate comparison		X		X	

VOCs - volatile organic compounds
%R - percent recovery
RPD - relative percent difference
MS - matrix spike
MSD - matrix spike duplicate
NA - not analyzed or not applicable
BS - blank spike
BSD - blank spike duplicate

Comments:
This section was reviewed and completed for Method 8015/ Fuel ID, TPH. Performance was acceptable, with the following exceptions and notes.

2. The following samples were analyzed at dilution for the following analyses. All reporting limits were adjusted accordingly:

Sample	Dilution factor	Method
P-2	2X	8015/Fuel ID

3. The following blanks were analyzed by Method 8015 TPH. No contamination was detected.

Sample	Report	Analyte(s)	Action
FB-3	99-1482	ND	Clean blank
RB-3	99-1482	ND	Clean blank
FB-9	99-2724	ND	Clean blank
RB-9	99-2724	ND	Clean blank

4-6. The following samples were used for 8015/FFP MS/MSD analysis.

Sample	Report	Results
Batch	99-1482	Acceptable
Batch	99-2656	Acceptable
Batch	99-2725	Acceptable
Batch	99-2582	Acceptable
Batch	99-2724	Acceptable

ORGANIC ANALYSES Cont.

8. A Laboratory Control Sample was analyzed with each Method 8015/FFP sample batch. All results were acceptable.

12. Field duplicate evaluation is applied using 20% RPD for water samples and 35% RPD for soil samples. The following analytical results for the primary sample and field duplicate are qualified as "J/Estimated, detected," when the %RPD is +/-20% for detected results greater than 5X the detection limit.

Duplicate sample, BL-17, was compared to primary sample, BL-1, for 8015/FFP. The following is a comparison of detected results only. All other analytes were reported as ND for both samples.

Analyte	BL-17(ppb)	BL-1(ppb)	%RPD	PQL
Diesel fuel	450	560	22%	200

Duplicate sample, P-29, was compared to primary sample, P-20, for 8015/Fuel ID and Hexavalent Chromium analysis.

Analyte	P-29 (ppb)	P-20 (ppb)	%RPD	PQL
8015/FFP	ND	ND	0%	NA

ORGANIC ANALYSES
VOLATILE ORGANIC COMPOUNDS

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
1. Holding times		X		X	
2. Reporting limits		X		X	
3. Blanks					
A. Water blanks (VOCs)		X		X	
B. Equipment rinsate blanks		X	X		
C. Field Blanks		X	X		
D. Trip blanks		X	X		
4. Matrix spike (MS) %R		X		X	
5. Matrix spike duplicate (MSD) %R		X		X	
6. MS/MSD precision (RPD)		X		X	
7. Laboratory duplicate precision (optional)	X				X
8. Reagent water spike (BS)	X				X
9. Reagent water spike duplicate (BSD)	X				X
10. BS/BSD precision (RPD)	X				X
11. Laboratory control sample (LCS)		X		X	
12. Surrogate spike recoveries		X		X	
13. Field duplicate comparison		X		X	

VOCs - volatile organic compounds
RRF - relative response factor
% RSD - percent relative standard deviation
TIC - tentatively identified compound
%D - percent drift
%R - percent recovery
RPD - relative percent difference
BS - blank spike
BSD - blank spike duplicate

Comments:
This section was reviewed and completed for Method 8260/VOCs.
Performance was acceptable, with the following exceptions and notes.

2. The following samples were analyzed at dilution due to high concentration of the following analytes. All reporting limits were adjusted accordingly:

Sample	Dilution factor	Analytes
BL-3	25X	Trichloroethene
BL-6	500X	Trichloroethene
P-7	25X	Trichloroethene
P-16A	25X	Trichloroethene
P-20	100X	Trichloroethene
P-29	100X	Trichloroethene
P-17	25X, 25X	Trichloroethene, Tetrachloroethene
P-1	100X	Trichloroethene
P-24	5X	Trichloroethene
P-9B	25X	Trichloroethene
P-22	25X	Trichloroethene
P-12	25X	Trichloroethene
P-16C	5X	Trichloroethene

3. The following blanks were submitted for Method 8260/VOCs analysis. In accordance with the National Functional Guidelines, detected results less than 5X the amount found in any blank should be qualified as "U/Not detected." Methylene chloride is a common laboratory contaminant, and detected results less than 10X the amount found in any blank should be qualified as "U/Not detected." Results reported as ND require no further action. All other blanks listed below were free of contamination and required no further action.

Sample	Report	Analyte(s) detected	Action
TB-8	99-2580	Methylene Chloride, 2.9 ppb	All assoc. samples ND, no action
TB-7	99-2652	Methylene Chloride, 1.9 ppb	All assoc. samples ND, no action
TB	99-2582	Methylene Chloride, 0.91 ppb	All assoc. samples ND, no action
TB-6	99-2497	Methylene Chloride, 2.8 ppb	All assoc. samples ND, no action
TB-6	99-2497	Trichloroethene, 0.52 ppb	Assoc. samples detected >5X, no action
EB-1	99-2582	Methylene Chloride, 0.84 ppb	All assoc. samples ND, no action
FB-6	99-2497	no contamination detected	no action
EB-6	99-2497	no contamination detected	no action
FB-8	99-2652	no contamination detected	no action
EB-8	99-2652	no contamination detected	no action
FB-7	99-2580	no contamination detected	no action
EB-7	99-2580	no contamination detected	no action
EB-3	99-2725	Chloroform, 0.57 ppb	Assoc. samples detected >5X, no action
EB-4	99-2725	Chloroform, 0.60 ppb	Assoc. samples detected >5X, no action
TB-3	99-1482	Methylene Chloride, 1.2 ppb	All assoc. samples ND, no action
FB-3	99-1482	no contamination detected	no action
EB-3	99-1482	no contamination detected	no action
TB	99-2656	Methylene Chloride, 3.0 ppb	All assoc. samples ND, no action
EB-2	99-2656	no contamination detected	no action
TB-9A	99-2724	Methylene Chloride, 2.1 ppb	All assoc. samples ND, no action
TB-9B	99-2724	Methylene Chloride, 2.2 ppb	All assoc. samples ND, no action
FB-9	99-2724	no contamination detected	no action
EB-9	99-2724	no contamination detected	no action

4-6. The following samples were used for MS/MSD analysis. All results were acceptable, unless otherwise noted.

Sample	Reports	Results
P-3	99-2580	Acceptable
FB-6**	99-2497	Acceptable
P-10	99-2582	Acceptable
FB-5 **	99-1965	Acceptable
Batch	99-2725	Acceptable
FB-1**	99-1616	Acceptable
FB-2 **	99-1352	Acceptable
BL-5-8	99-1482	Acceptable
EB-2**	99-2652, 99-2724, 99-2656	% recovery outside control limits. *

*The % recovery for the analyte, Bromodichloromethane, (70,76%), failed to meet the acceptable control limits, 80-120%. In accordance with the National Functional Guidelines, additional QC parameters, (LCS and additional field MS/MSD samples) were evaluated and are acceptable. Using professional judgment, no qualification of data was necessary.

**It should be noted that Field and Equipment blank samples were used as MS/MSD samples. This is an unacceptable practice and the lab has been notified not to use Field/Equipment blanks for MS/MSD for future analytical analysis.

11. A Laboratory Control Sample was evaluated for each batch of field samples analyzed by Method 8260/VOCs. All results were acceptable.

13. Duplicate sample, BL-17, was compared to primary sample, BL-1, for 8260/VOC analysis. The following is a comparison of detected results only. All other analytes were reported as ND for both samples. Field duplicate evaluation is applied using 20% RPD for water samples and 35% RPD for soil samples. The following analytical results for the primary sample and field duplicate are qualified as "J/Estimated, detected," when the %RPD is +/-20% for detected results greater than 5X the detection limit. No qualification was necessary.

Analyte	BL-17 (ppb)	BL-1 (ppb)	%RPD	PQL
Chloroform	0.60	0.57	5%	0.5
1,1-Dichloroethane	0.95	1.0	5%	0.5
cis-1,2-Dichloroethene	14	15	7%	0.5
Trichloroethene	6.8	6.6	3%	0.5

13. Duplicate sample, P-29, was compared to primary sample, P-20, for 8260/VOC analysis. The following is a comparison of detected results only. All other analytes were reported as ND for both samples. Field duplicate evaluation is applied using 20% RPD for water samples and 35% RPD for soil samples. The following analytical results for the primary sample and field duplicate are qualified as "J/Estimated, detected," when the %RPD is +/-20% for detected results greater than 5X the detection limit. No qualification was necessary.

Analyte	P-29 (ppb)	P-20 (ppb)	%RPD	PQL
Benzene	2.1	2.3	5%	0.5
Bromodichloromethane	ND	0.65	Trace	0.5
Chloroform	23	24	4%	0.5
1,1-Dichloroethane	0.55	0.59	7%	0.5
1,1-Dichloroethene	7.8	8.2	5%	0.5
cis-1,2-Dichloroethene	21	22	5%	0.5
trans-1,2-Dichloroethene	1.7	1.7	0%	0.5
Tetrachloroethene	15	17	13%	0.5
1,1,2-Trichloroethane	7.3	7.5	3%	0.5
Trichloroethene	6800	6900	1%	0.5

DATA VALIDATION CHECKLIST
SUMMARY AND DATA QUALIFIER CODES

Project Name	Lockheed Martin/ILM				
Project Number	CA000280.0004 Task:00002				
Soil Samples, collected in February, 1999	**99-1616**	**99-1965**	**99-1352**	**99-1424**	**99-1482**
	FB-4	BL-4-7	BL-1-11.5	BL-2-11.5	BL-5-8
	RB-4	BL-4-17	BL-1-21	BL-2-21.5	BL-5-10
	BL-3-13	FB-5	BL-1-23.7	FB-2	BL-5-20
	BL-3-23	RB-5	FB-1	RB-2	TB-1
	BL3-25.7	BL-8-12	RB-1	BL-6-11	FB-2
		BL-8-22		BL-6-21	RB-3
Groundwater Samples, collected in March, 1999	**99-2656**	**99-2582**	**99-2725**	**99-2497**	**99-2724**
	P-6B	P-10	P-7	BL-6	TB-9A
	EB-2	P-3	P-16A	FB-6	TB-9B
	P-24	EB-1	P-20	RB-6	FB-9
	P-9B	Trip blank	P-29	TB-6	RB-9
	P-22	**99-2580**	EB-3	**99-2652**	BL-5
	P-12	BL-7	P-17	TB-8	BL-17
	P-2	BL-4	P-1	RB-8	BL-1
	P-16C	BL-8	EB-4	FB-8	
		TB-7		BL-3	
		RB-7		BL-2	
		FB-7			
Sample Date(s)	Soil (2/2, 2/3, 2/4,2/8, 2/16/99), and Liquid (3/1, 3/2, 3/3, 3/4/99)				
Sample Team	ARCADIS Geraghty & Miller- B. Hawes				
Sample Matrix	Soil, Liquid				
Analyzing Laboratory	BC Laboratories, Inc.				
Analyses	8260/VOCs	CAM 17 Metals	Hexavalent		
	8015/Fuel ID (FFP)	(Total and Dissolved)	Chromium (Cr^{6+})		
QA Reporting Level	ARCADIS Geraghty & Miller, Inc. Contract Level II				
Laboratory Report No.	99-2580, 99-1965, 99-2652, 99-2497, 99-2724, 99-2656, 99-2725, 99-1352, 99-2582, 99-1424, 99-1616, 99-1482				

SUMMARY AND DATA QUALIFIER CODES

Sample ID	Analyte(s)	Result(ppb)	Qualifier	Reason(s)
BL-6	Copper	12	U	Contaminated field blank
BL-8	Copper	22	U	Contaminated field blank
BL-4-7	Antimony	1.0	J	MS/MSD % rec. outside control limits
BL-4-17	Antimony	ND	UJ	MS/MSD % rec. outside control limits
BL-8-12	Antimony	1.1	J	MS/MSD % rec. outside control limits
BL-8-22	Antimony	ND	UJ	MS/MSD % rec. outside control limits
BL-1-23.7	Antimony	0.8	J	MS/MSD % rec. outside control limits
BL-1-21	Antimony	ND	UJ	MS/MSD % rec. outside control limits
BL-1-11.5	Antimony	1.4	J	MS/MSD % rec. outside control limits
BL-3-25.7	Antimony	1.0	J	MS/MSD % rec. outside control limits
BL-3-13	Antimony	0.89	J	MS/MSD % rec. outside control limits
BL-3-23	Antimony	5.9	J	MS/MSD % rec. outside control limits
BL-7-14.5	Antimony	1.2	J	MS/MSD % rec. outside control limits
BL-7-24.5	Antimony	0.86	J	MS/MSD % rec. outside control limits
BL-2-11.5	Antimony	0.72	J	MS/MSD % rec. outside control limits
BL-2-21.5	Antimony	ND	UJ	MS/MSD % rec. outside control limits
BL-6-11	Antimony	ND	UJ	MS/MSD % rec. outside control limits
BL-6-21	Antimony	ND	UJ	MS/MSD % rec. outside control limits
BL-5-10	Antimony	ND	UJ	MS/MSD % rec. outside control limits
BL-5-20	Antimony	0.52	J	MS/MSD % rec. outside control limits

Sample ID	Analyte(s)	Result(ppb)	Qualifier	Reason(s)
BL-5-20	Antimony	0.52	J	MS/MSD % rec. outside control limits
P-24	Titanium	274	J	MS/MSD % rec. outside control limits
P-9B	Titanium	295	J	MS/MSD % rec. outside control limits
P-22	Titanium	139	J	MS/MSD % rec. outside control limits
P-2	Titanium	73	J	MS/MSD % rec. outside control limits
P-16C	Titanium	209	J	MS/MSD % rec. outside control limits
BL-2-11.5	Titanium	1710	J	MS/MSD % rec. outside control limits
BL-2-21.5	Titanium	1600	J	MS/MSD % rec. outside control limits
BL-6-11	Titanium	1890	J	MS/MSD % rec. outside control limits
BL-6-21	Titanium	1900	J	MS/MSD % rec. outside control limits
BL-5-10	Titanium	1670	J	MS/MSD % rec. outside control limits
BL-5-20	Titanium	1620	J	MS/MSD % rec. outside control limits
BL-3-25.7	Titanium	1630	J	MS/MSD % rec. outside control limits
BL-3-23	Titanium	1350	J	MS/MSD % rec. outside control limits
BL-3-25.7	Zinc	74	J	MS/MSD % rec. outside control limits
BL-3-13	Zinc	70	J	MS/MSD % rec. outside control limits
BL-3-23	Zinc	70	J	MS/MSD % rec. outside control limits
P-2	Hex. Chromium	2.5	J	Exceeded Holding Time
P-16C	Hex. Chromium	ND	UJ	Exceeded Holding Time
BL-5-10	Hex. Chromium	1.2	J	Exceeded Holding Time
BL-1-11.5	Hex. Chromium	0.4	J	Exceeded Holding Time
P-10	Hex. Chromium	31	J	Exceeded Holding Time
BL-17	Aluminum	131,000	J	Field Dup. %RPD outside control limits
BL-17	Arsenic	166	J	Field Dup. %RPD outside control limits
BL-17	Barium	508	J	Field Dup. %RPD outside control limits
BL-17	Chromium	280	J	Field Dup. %RPD outside control limits
BL-17	Cobalt	111	J	Field Dup. %RPD outside control limits
BL-17	Copper	146	J	Field Dup. %RPD outside control limits
BL-17	Iron	229,000	J	Field Dup. %RPD outside control limits
BL-17	Lead	87	J	Field Dup. %RPD outside control limits
BL-17	Titanium	7510	J	Field Dup. %RPD outside control limits
BL-17	Vanadium	459	J	Field Dup. %RPD outside control limits
BL-17	Zinc	654	J	Field Dup. %RPD outside control limits
BL-1	Aluminum	97,800	J	Field Dup. %RPD outside control limits
BL-1	Arsenic	110	J	Field Dup. %RPD outside control limits
BL-1	Barium	367	J	Field Dup. %RPD outside control limits
BL-1	Chromium	195	J	Field Dup. %RPD outside control limits
BL-1	Cobalt	73	J	Field Dup. %RPD outside control limits
BL-1	Copper	110	J	Field Dup. %RPD outside control limits
BL-1	Iron	154,000	J	Field Dup. %RPD outside control limits
BL-1	Lead	55	J	Field Dup. %RPD outside control limits
BL-1	Titanium	4920	J	Field Dup. %RPD outside control limits
BL-1	Vanadium	317	J	Field Dup. %RPD outside control limits
BL-1	Zinc	394	J	Field Dup. %RPD outside control limits

U= not detected J= Estimated, detected UJ= Estimated, non-detect % rec. = % recovery

Explanation/Notes:

The analytical data presented in the above referenced report were reviewed in accordance with the "USEPA National Functional Guidelines for the review of Inorganic/Organic Data, dated February 1994." Data in the above referenced table is considered qualitative. Please reference the corresponding data section for a detailed explanation. All other data values presented in this report are considered quantitative.

VALIDATION PERFORMED BY
SIGNATURE: Charles Mick

DATE: 5/11/99

PEER REVIEW
SIGNATURE: Cindy Arnold

DATE: 5/11/99

BCL's Holding Time Policy Regarding Hexavalent Chromium

Aqueous samples must be analyzed within 24 hours of field sampling. In cases when samples are composites, hexavalent chromium must be analyzed within 24 hours of the last field aliquot addition to the composite.

Solid samples must be analyzed within thirty days of field sampling. In cases when samples are composites, hexavalent chromium must be analyzed within 30 days of the last field aliquot addition to the composite. DI-STLC and water extracts must be analyzed within 24 hours of lab filtering. Sample filtrations should take place as soon as possible after respective extractions.

In all cases, samples should be analyzed as soon as possible.

TABLE 3-1.

SAMPLE HOLDING TIMES, RECOMMENDED DIGESTION VOLUMES AND RECOMMENDED COLLECTION VOLUMES FOR INORGANIC DETERMINATIONS IN AQUEOUS AND SOLID SAMPLES

Measurement	Digestion Volume. (mL)[a, c]	Collection Volume (mL)[a,c]	Treatment/ Preservative Holding Time[b]
Inorganic Analytes (except hexavalent chromium and mercury):			
Aqueous			
Total	100	600	HNO_3 to pH <2 6 months
Dissolved	100	600	Filter on site; HNO_3 to pH <2 6 months
Suspended	100	600	Filter on site 6 months
Solid			
Total	2 g	200 g	6 months
Hexavalent Chromium:			
Aqueous	100	400	24 hours Store at 4°± 2°C until analyzed
Solid	2.5 g	100 g	One month to extraction, 4 days after extraction Store at 4°± 2°C until analyzed
Mercury:			
Aqueous			
Total	100	400	HNO_3 to pH <2 28 days
Dissolved	100	400	Filter; HNO_3 to pH <2 28 days
Solid			
Total	0.2 g	200 g	28 days Store at 4°± 2°C until analyzed

[a] Unless stated otherwise.
[b] Either glass or plastic containers may be used.
[c] Any sample volume reduction from the reference method's instructions must be made in the exact proportion as described in the method and representative sampling must be maintained.